Sustainability Depends on Data

Data is opening the door to a better world – literally, a better environment. Natural resource scientists use knowledge of living systems plus modern technology to compile and analyze information and make decisions to sustain, repair, and enhance life on Earth.

A New York Times article on April 11, 2013, calls data scientists "magicians" and references the potential touted by a McKinsey Global Institute study that predicts, "By 2018, the United States alone could face a shortage of 140,000 to 190,000 people with deep analytical skills as well as 1.5 million managers and analysts with the know-how to use the analysis of big data to make effective decisions."

Landsat image of the Lena River delta, the most extensive protected wilderness area in Russia.

Front cover image: The Landsat 5 Earth observation satellite in orbit.

What is Environmental Informatics?

The use of computers, digital technology, and modeling to solve environmental problems.

Why is it important?

Today's problems are increasingly complex and involve vast amounts of data. They require computers and modeling to solve them.

Who might find this major a good fit?

Students who are good with numbers, enjoy computing, and want to make a positive difference to the environment.

What are career options?

- Environmental data scientist
- Ecosystems services consultant
- Ecological forecasting specialist
- Ecoinformaticist
- Environmental modeler
- Sustainability analyst

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VirginiaTech
College of Natural Resources and Environment

Environmental Informatics

ADVANCING THE SCIENCE OF SUSTAINABILITY

Opens a World of Opportunity

VirginiaTech
Invent the Future®

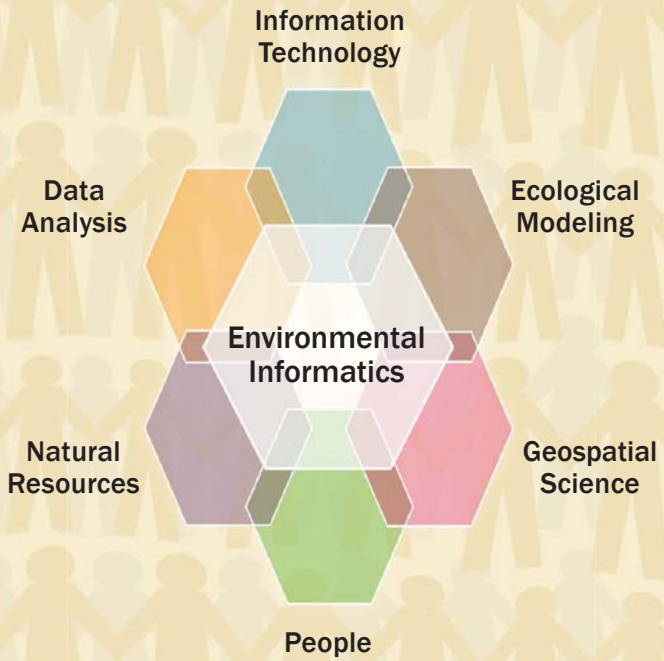
Big Data Computes to Big Jobs

Conservation of natural resources, sustainability, impact assessment, planning, and management have grown increasingly reliant on computer-based approaches in the past few decades. Dynamic-simulation modeling, statistics, database management, geographic information systems (GIS), and remote sensing are utilized in many environmental professions and applications, ranging from forestry and landscape mapping, to pollution modeling and watershed ecology, and many more.

As a result, the need for professionals trained in technical and analytical approaches to environmental problems is rising dramatically.

Environmental Informatics applies information science to the management of natural resources. It includes aspects of geographic information, mathematical and statistical modeling, remote sensing, database management, knowledge integration, and decision making.

Landsat Thematic Mapper image of the New River Valley, showing forests (dark green), agriculture (light green), and development or bare soil (pink), bisected by the New River (black).



Environmental Informatics brings together science, technology, modeling, and analysis — enabling increased understanding and sustainable management of the natural world.

Environmental Informatics Students Develop Needed Skills

A new **Environmental Informatics Major** in the College of Natural Resources and Environment helps students develop these critical analytical and decision skills for the 21st century job market:

- Environmental problem solving
- Effective oral and written communications
- Mathematical and statistical modeling
- Remote sensing
- Geographic information systems (GIS)
- Ecosystem management
- Web and database management
- Spatial data analysis
- Sustainability analytics

Graduates Will Know How to Solve Environmental Problems

The college's Department of Forest Resources and Environmental Conservation provides an education on how life works, from the microscopic to the Earth-systems level. Its Environmental Informatics Major brings together enhanced data gathering and knowledge integration using such tools as computer science, GIS, remote sensing, database management, and data visualization and modeling. The result is environmental problem solving.

Scholars across the Virginia Tech campus are responding to the nation's call for unique approaches to science, technology, engineering, and mathematics (STEM) education for undergraduate students. The Environmental Informatics Major is one of many strategic efforts by the College of Natural Resources and Environment.

The amount of data being collected to monitor the Earth's ecosystems is enormous. Graduates of the Environmental Informatics Major will be part of a new wave of data scientists trained to handle vast amounts of data for different specialties.

Students during a summer internship measure light conditions and canopy leaf area in a regenerating oak forest. Their work reveals how growing conditions affect the health of young trees.